

Claims

We claim:

- 1           1. A polynucleotide molecule that comprises a nucleotide sequence encoding an  
2           active toxin and a nucleotide sequence encoding a phage vector protein.
- 1           2. A nucleotide molecule of claim 1 wherein said toxin is derived from *Bacillus*  
2           *thuringiensis*.
- 1           3. The polynucleotide molecule of claim 1 wherein said phage vector protein is  
2           derived from a filamentous phage vector.
- 1           4. The polynucleotide molecule of claim 1 wherein said nucleotide sequence  
2           encoding an active toxin and said nucleotide sequence encoding a phage vector protein are  
3           expressed as a fusion protein such that a phage is formed having said active toxin displayed  
4           on the surface thereof.
- 1           5. The polynucleotide molecule of claim 1 that encodes a fusion protein as shown  
2           in Figure 1.
- 1           6. A polypeptide molecule comprising a phage region and a toxin region wherein  
2           said polypeptide molecule is arranged to form a phage having said toxin region displayed on  
3           the surface thereof.
- 1           7. The polypeptide molecule of claim 6 wherein said toxin region is derived from  
2           *Bacillus thuringiensis*.
- 1           8. The polypeptide of claim 6 having an amino acid sequence as shown in Figure 1.

1           9. A method of preparing active *Bacillus thuringiensis* toxins comprising  
2 transforming one or more cells with a polynucleotide molecule that comprises a nucleotide  
3 sequence which encodes for an active *Bacillus thuringiensis* toxin and a nucleotide sequence  
4 which encodes for a phage vector protein; and  
5           growing said one or more cells under conditions such that said polynucleotide  
6 molecule is expressed, thereby forming a fusion protein having toxic activity.

1           10. The method of claim 9 wherein said phage vector protein is derived from a  
2 filamentous phage vector.

1           11. The method of claim 9 wherein said polynucleotide molecule encodes a fusion  
2 protein having an amino acid sequence as shown in Figure 1.

1           12. The method of claim 9 wherein said one or more cells are prokaryotes.

1           13. The method of claim 13 wherein said one or more cells are of a type selected  
2 from the group consisting of *E. coli* strain JM109, *E. coli* strain JM101, *E. coli* K12 strain  
3 294, *E. coli* strain W 3110, *E. coli* X1776, *E. coli* XL-1Blue and *E. coli* B.

1           14. The method of claim 13 wherein said one or more cells are *E. coli* strain JM109.

1           15. A method of screening for novel *Bt* toxins comprising obtaining a phage display  
2 library comprising a plurality of recombinant phage having a toxin displayed on the surface  
3 thereof; and

4           screening said library to identify a phage clone comprising phage which bind to a  
5 toxin specific target.

1                    17. A phage clone comprising phage that comprise a polynucleotide molecule having  
2                    a nucleotide sequence that encodes a toxin, wherein said phage have said toxin displayed on  
3                    the surface thereof.

1 18. An isolated polynucleotide molecule produced by the method of claim 16.

1            19. One or more plant cells transformed with a polynucleotide molecule produced:  
2            by the method of claim 16.